AMENDMENT TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

- 1-37 (cancelled)
- 38. (New) A protein variant which substitutes a valine residue for a phenylalanine residue in a protein having a biological response-modifying function by binding to a receptor.
 - 39. (New) The protein variant according to claim 38, wherein the protein is a cytokine.
- 40. (New) The protein variant according to claim 39, wherein the cytokine is a 4-alpha helix bundle cytokine.
- 41. (New) The protein variant according to claim 40, wherein the 4-alpha helix bundle cytokine is selected from the group consisting of CNTF, EPO, F1t3L, G-CSF, GM-CSF, GH, IL-2, IL-3, IL-4, 1L-5, IL-6, IL-12p35, LPT, LIF, M-CSF, OSM, PL, SCF, TPO, IFN- α 2A, IFN- α 2B, IFN- β IFN- γ ,IPN- ω and IFN- τ .
- 42. (New) The protein variant according to claim 41, wherein the CNTF, EPO, F1t3L, G-CSF, GM-CSF, GH, IL-2, IL-3, IL4,. 1L-5, M-6, IL-12p35, LPT, L1F, M-CSF, OSM, PL, SCF and TPO are altered by substituting valine for phenylalanine residue of amino acid residues between positions 110 and 180.
- 43. (New) The protein variant according to claim 41, wherein the IFN- α 2A, IFN- α 2B, IFN- β IFN- γ ,IPN- ω and IFN- τ are altered by substituting valine for phenylalanine residue of amino acid residues between positions 1 and 50.
- 44. (New) The protein variant according to claim 41, wherein the CNTF is altered by substituting valine for phenylalanine residue at a position 3, 83, 98, 105, 119, 152 or 178 of an amino acid sequence designated as SEQ ID NO.: 1.
- 45. (New) The protein variant according to claim 41, wherein the EPO is altered by substituting valine for phenylalanine residue at a position 48, 138, 142 or 148 of an amino acid sequence designated as SEQ ID NO.: 2.

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- 46. (New) The protein variant according to claim 41, wherein the F1t3L is altered by substituting valine for phenylalanine residue at a position 6, 15, 81, 87, 96 or 124 of an amino acid sequence designated as SEQ ID NO.: 3.
- 47. (New) The protein variant according to claim 41, wherein the G-CSF is altered by substituting valine for phenylalanine residue at a position 13, 83, 113, 140, 144 or 160 of an amino acid sequence designated as SEQ ID NO.: 4.
- 48. (New) The protein variant according to claim 41, wherein the GM-CSF is altered by substituting value for phenylalanine residue at a position 47, 103, 106, 113 or 119 of an amino acid sequence designated as SEQ ID NO.: 5.
- 49. (New) The protein variant according to claim 41, wherein the GH is altered by substituting valine for phenylalanine residue at a position 1, 10, 25, 31, 44, 54, 92, 97, 139, 146, 166, 176 or 191 of an amino acid sequence designated as SEQ ID NO.: 6.
- 50. (New) The protein variant according to claim 41, wherein the IL-2 is altered by substituting valine for phenylalanine residue at a position 42, 44, 78,103,117 or 124 of an amino acid sequence designated as SEQ ID NO.: 13.
- 51. (New) The protein variant according to claim 41, wherein the IL-3 is altered by substituting valine for phenylalanine residue at a position 37, 61, 107, 113 or 133 of an amino acid sequence designated as SEO ID NO.: 14.
- 52. (New) The protein variant according to claim 41, wherein the IL-4 is altered by substituting valine for phenylalanine residue at a position 33, 45, 55, 73, 82 or 112 of an amino acid sequence designated as SEQ ID NO.:15.
- 53. (New) The protein variant according to claim 41, wherein the IL-5 is altered by substituting valine for phenylalanine residue at a position 49, 69, 96 or 103 of an amino acid sequence designated as SEQ ID NO.: 16.
- 54. (New) The protein variant according to claim 41, wherein the IL-6 is altered by substituting valine for phenylalanine residue at a position 73, 77, 93, 104, 124, 169 or 172 of an amino acid sequence designated as SEQ ID NO.: 17.

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- 55. (New) The protein variant according to claim 41, wherein the IL-12p35 is altered by substituting valine for phenylalanine residue at a position 13, 39, 82, 96, 116132, 150, 166 or 180 of an amino acid sequence designated as SEQ ID NO.: 18.
- 56. (New) The protein variant according to claim 41, wherein the LPT is altered by substituting valine for phenylalanine residue at a position 41 or 92 of an amino acid sequence designated SEQ ID NO.: 19.
- 57. (New) The protein variant according to claim 41, wherein the LIF is altered by substituting value for phenylalanine residue at a position 41, 52, 67, 70, 156 or 180 of an amino acid sequence designated as SEQ ID NO.: 20.
- 58. (New) The protein variant according to claim 41, wherein the M-CSF is altered by substituting valine for phenylalanine residue at a position 35, 37, 54, 67, 91, 106, 121, 135, 143, 255, 311, 439, 466 or 485 of an amino acid sequence designated as SEQ ID NO.: 21.
- 59. (New) The protein variant according to claim 41, wherein the OSM is altered substituting vane for phenylalanine residue at a position 56, 70, 160, 169, 176 or 184 of an amino acid sequence designated as SEQ ID NO.: 22.
- 60. (New) The protein variant according to claim 41, wherein the PL is altered by substituting valine for phenylalanine residue at a position 10, 31, 44, 52, 54, 92, 97, 146, 166, 176 or 191 of am amino acid sequence designated as SEQ ID NO.: 23.
- 61. (New) The protein variant according to claim 41, wherein the SCF is altered by substituting valine for phenylalanine residue at a position 63, 102, 110, 115, 116, 119, 126, 129, 158, 199, 205, 207 or 245 of an amino acid sequence designated as SEQ ID NO.: 24.
- 62. (New) The protein variant according to claim 41, wherein the TPO is altered by substituting valine for phenylalanine residue at a position 46, 128, 131, 141, 186, 204, 240 or 286 of an amino acid sequence designated as SEQ ID NO.: 25.
- 63. (New) The protein variant according to claim 41, wherein the IFN-α2A is altered by substituting valine for phenylalanine residue at a position 27, 36, 38, 43, 47, 64, 67, 84, 123 or 151 of an amino acid 15 sequence designated as SEQ ID NO.: 7.

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- 64. (New) The protein variant according to claim 41, wherein the IFN-α2B is altered by substituting valine for phenylalanine residue at a position 27, 36, 38, 43, 47, 64, 67, 84, 123 or 151 of an amino acid sequence designated as SEQ ID NO.: 8.
- 65. (New) The protein variant according to claim 41, wherein the IFN-13 is altered by substituting value for phenylalanine residue at a position 8, 38, 50, 67, 70, 111 or 154 of an amino acid sequence designated as SEQ ID NO.: 9.
- 66. (New) The protein variant according to claim 41, wherein the IFN-γ is altered by substituting valine for phenylalanine residue at a position 18, 32, 55, 57, 60, 63, 84, 85, 95 or 139 of amino acid sequence designated as SEQ ID NO.: 10.
- 67. (New) The protein variant according to claim 41, wherein the IFN-ω is altered by substituting valine for phenylalanine residue at a position 27, 36, 38, 65, 68, 124 or 153 of an amino acid sequence designated as SEQ ID NO.: 11.
- 68. (New) The protein variant according to claim 41, wherein the IFN-τ is altered by substituting valine for phenylalanine residue at a position 8, 39, 68, 71, 88, 127, 156, 157, 159 or 183 of an amino acid sequence designated as SEQ ID NO.: 12.
 - 69. (New) A DNA molecule encoding the protein variant according to claim 1.
- 70. (New) A recombinant expression vector to which the DNA according to claim 69 is operably linked.
- 71. (New) The recombinant expression vector according to claim 70, wherein the recombinant expression vector has an accession number KCCM-10500, KCCM-10501 or KCCM-10571.
- 72. (New) A host cell transformed or transfected with the recombinant expression vector according to claim 70.
- 73. (New) A method of preparing a protein variant, comprising cultivating the host cell according to claim 72 and isolating the protein variant from a resulting culture.
- 74. (New) A pharmaceutical composition comprising the protein variant according to claim 1 and a pharmaceutically acceptable carrier.